

**TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY PERMIT NO. 43894**

I. INTRODUCTION

This Class II Air Quality Synthetic Minor Permit is issued to AgriNext Ethanol, LLC. (AgriNext) to construct and operate a Fuel-Grade Ethanol Production facility near Tacna, Arizona. The facility is permitted to produce 65 million gallons per year of un-denatured ethanol.

A. Company Information

Facility Name: AgriNext Ethanol Plant – Yuma

Mailing Address: 1500 Broadway
Time Square Plaza, STE 2011
New York, NY 10036
New York County

Facility Address: 47 3/4 E & Old US 80
Tacna, AZ 85352
Yuma County

B. Attainment Classification

The source is in an attainment area with respect to all the criteria pollutants

II. FACILITY DESCRIPTION

Emission sources at the facility include grain receiving, fermentation, distillation, distillers dried grains with solubles (DDGS) drying, DDGS handling, combustion, storage tanks, production loadout and fugitives.

A. Process Description

Production of ethanol is based on conversion of cornstarch into sugars and then conversion of sugars to ethanol (grain alcohol). The facility is proposing to receive corn by truck or rail. The corn will be stored in bins prior to processing. The corn will be ground using a hammermill and conveyed to the process area. Water will then be added to the milled corn to create a slurry. The slurry will be cooked, liquefacted with enzymes, and the resultant mash cooled. The mash will be mixed with yeast and more enzymes in a fermenter. After approximately 48 hours of fermentation the resultant liquid (beer) will contain 11% - 15% ethanol by weight. The beer will distill in a four-column distillation process; the resultant product is 95% ethanol and 5% water (190 proof) and whole stillage consisting of solids and water.

Using molecular sieves, the remaining 5% water will be removed from the product resulting in 100 % ethanol (200-proof). The product will then be combined with 5%

natural gasoline and sold as near 200-proof de-natured ethanol. The whole stillage is centrifuged to remove the water. The removed water is evaporated until a syrup remains. The syrup is combined with the centrifuged wet spent grain and dried in a dryer system. The dried spent grain will then be pneumatically conveyed by a DDGS cooling conveyor to be stored before loadout. The resulting saleable spent grain by-product is sold as Distillers Dried Grain and Solubles (DDGS). The DDGS will then be loaded into trucks and railcars for distribution.

The facility will use anhydrous ammonia and have storage greater than 10,000 pounds. The anhydrous ammonia will be fed directly to the process for pH control and is consumed by the process liquid.

B. Air Pollution Control Equipment

Scrubbers and baghouses are installed on equipment to control particulate matter emissions. Fugitive dust emissions are controlled by using water sprays, road watering/suppressants. The boilers will have a Selective Non-Catalytic Reduction (SNCR) system and wet scrubber to control nitrogen oxide (NO_x) emissions. The cooling towers will be equipped with a drift eliminator. A flare is used to minimize VOC emissions from loadout of ethanol via rail or truck.

III. EMISSIONS

The facility is classified as a Synthetic Minor Source pursuant to Arizona Administration Code (A.A.C.) R18-2-101.61. Table #1 quantifies the total potential emissions from the entire facility.

Table 1: Facility Wide Controlled Emissions

Pollutant	Emissions
	Tons/year
CO	91.5
NO _x	91.6
SO ₂	91.3
VOC	65.6
PM ₁₀	65.4
PM	65.4
HAPs	12.47

IV. APPLICABLE REGULATIONS

Table 2 identifies the applicable regulations corresponding to every process unit and also provides verification as to why that standard applies

Table 2: Verification of Applicable Regulations

Unit	Control Device	Rule	Verification
Boilers	SNCR and Wet Scrubbers, Good Combustion Practices, Wet Scrubbers and Baghouses, Dry Sorbent	40 CFR 60, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.
Internal Combustion Engines	N/A	40 CFR 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
NSPS Storage Tanks	Internal Floating Roofs	40 CFR 60, Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels
Equipment used in Synthetic Organic Chemicals Manufacturing – Equipment covered in this Section are as follows: Pumps in light liquid service, Compressors, Pressure relief devices in gas/vapor service, Sampling connection systems, Open-ended valves or lines, Valves in gas/vapor service and in light liquid service, Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, Closed vent systems and control devices	N/A	40 CFR 60, Subpart VV _a	Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006
Cooling Towers	N/A	A.A.C. R18-2-730	Standards of Performance for Unclassified Sources
Miscellaneous Equipment - Conveyors, Elevators, Storage Bins, Coal Silo, Fermentation Units, Centrifuges, Evaporators, Rectifier Columns, Thin Stillage Units, Sulfuric Acid Tank, Ammonia Tank, Whole Stillage Tank, Syrup Tank, Slurry Tank, Liquefaction Tank, Yeast Tank, hammermills, DDGS Dryer, DDGS Cooler, DDGS Truck Loadout, DDGS Rail Loadout, Ethanol Rail Loadout, Ethanol Truck Loadout, Molecular Sieve	N/A	A.A.C. R18-2-730	Standards of Performance for Unclassified Sources
Flare	N/A	40 CFR 60.18	General Control Device Requirements

Unit	Control Device	Rule	Verification
Ethanol Unloading (Truck and Rail)	N/A		
Fugitive dust	Water and other reasonable precautions	Article 6, A.A.C. R18-2-702	These are applicable to any fugitive dust source.
Mobile sources	Water Sprays/Water Truck for dust control	Article 8	This Article is applicable to off-road mobile sources, which either move while emitting air pollutants or are frequently moved during the course of their utilization.
Spray painting operations	N/A	A.A.C. R-18-2-727	This standard is applicable to any spray painting operation.
Demolition/renovation operations	N/A	A.A.C. R18-2-1101.A.8	This standard is applicable to any asbestos related demolition or renovation operations.

V. MONITORING RECORD KEEPING AND REPORTING REQUIREMENTS

A. Boilers - NSPS

1. Recordkeeping Requirements

- a. The Permittee is required to record and maintain records of the amounts of fuel combusted during each day.
- b. The Permittee is required to maintain records of the fuel supplier certifications.
- c. The Permittee is required to log all maintenance activities performed on the baghouses.
- d. The Permittee is required to calculate and record rolling 12-month NO_x and CO emissions from all four boilers.
- e. The Permittee must record on a weekly basis the change in pressure of the gas stream across each operating scrubber, the scrubbing liquid flow rate, and the scrubbing liquid pH.

2. Monitoring Requirements

- a. The Permittee is required to install Continuous Opacity Monitoring Systems (COMS).
- b. A black light inspection on the filtration bags contained in the baghouse on the boilers is required to be conducted once every quarter, in an effort to detect broken or leaking bags. Any broken or leaking bags must be repaired or replaced.

- c. The Permittee is required to collect daily coal samples and analyze for the sulfur content and heat content.

3. Reporting Requirements

- a. Upon completion of the black light inspection conducted to detect broken or leaking bags, the Permittee must record the name of the inspector, the date, time and the result of the inspection and repairs.
- b. The Permittee is required to submit initial and subsequent performance test data and reports as required by 40 CFR 60, Subpart Dc.

B. Internal Combustion Engines – NSPS Requirements

1. Recordkeeping Requirements

- a. The Permittee is required to keep records of all notifications and documentation supporting any notification, maintenance conducted on the engines, documentation that the certified / non-certified engine meets emission standards.
- b. The Permittee is required to keep records of performance test results for each pollutant, engine manufacturer data indicating compliance with the standards, or control device vendor data indicating compliance with the standards.
- c. The Permittee is required to keep monthly records of engine operation. The records must include the purpose of operation and the duration of time the engine was operated. The record must identify whenever the operation of the engine was for emergency purposes.

2. Reporting Requirements

The Permittee is required to submit an initial notification of the date when construction is commenced for Non-emergency ICEs greater than 3000 hp or has a displacement greater than or equal to 10 litres per cylinder, or pre-2007 model year engine that is greater than 175 horsepower and not certified. This notification must be postmarked no later than 30 days after the date when construction is commenced.

C. Storage Tanks – NSPS Requirements

1. Monitoring Requirements

The following visual inspections must be conducted in accordance with the time intervals described below to ensure compliance with volatile organic compounds standards:

- a. Inspect the internal floating roof, the primary seal, and the secondary seal (if one is in service), prior to filling the storage vessel with VOL. If there are hole, tears, or other openings the Permittee is required to take appropriate corrective action.
- b. Vessels equipped with a liquid-mounted or mechanical shoe primary seal the Permittee shall inspect the internal floating roof and the primary seal or the secondary seal (if one is in service) through manholes and roof hatches on the fixed roof at least once every 12 months after initial fill.

- c. Inspect the internal floating roof, the primary seal, the secondary seal (if one is in service), gaskets, slotted membranes and sleeve seals (if any) each time the storage vessel is emptied and degassed. If the internal floating roof has defects the Permittee is required to take appropriate corrective action.

2. Recordkeeping Requirements

- a. The Permittee is required to keep a record of each inspection performed on storage tanks. Each record shall identify the storage vessel on which the inspection was performed and shall contain the date the vessel was inspected and the observed condition of each component of the control equipment (seals, internal floating roof, and fittings).
- b. The Permittee is required to keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel.

D. Synthetic Organic Chemicals Manufacturing (Equipment covered in this Section are as follows: Pumps in light liquid service, Compressors, Pressure relief devices in gas/vapor service, Sampling connection systems, Open-ended valves or lines, Valves in gas/vapor service and in light liquid service, Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, Closed vent systems and control devices)

a. Reporting Requirements

- a. The Permittee is required to submit semi-annual reports to the director.
- b. The Permittee is required to report the results of the performance tests.

2. Recordkeeping Requirements

- a. The Permittee is required to keep a record of the leaks detected at the facility and the corrective action taken to repair the leak.
- b. The Permittee is required to keep records of the design specifications for closed vent systems.
- c. The Permittee is required to keep a record of identification numbers for valves and pumps unsafe-to-monitor and valves that are difficult-to-monitor.
- d. The Permittee is required to record the design criteria, explanation of design criteria and any changes to the design criteria as required by the permit.

E. Cooling Towers

1. Monitoring, recordkeeping and reporting requirements

- a. The Permittee is required to perform monthly surveys of visible emissions from the cooling towers in operation. If any observation appears to exceed the opacity standard, Permittee must conduct and record a proper Method 9 observation. If this observation is in excess of the opacity standard, suitable corrective action must be taken and also reported to the agency as an "excess

emission”. The Permittee is required to keep records of all surveys, observations, and results.

- b. The Permittee is required to perform monthly inspections of the drift eliminators to verify performance. The Permittee must keep records of the results of the inspections and any repairs performed in a written facility log.
- c. The Permittee is required to perform monthly analysis and keep records of the total dissolved solids in the chiller system circulation water.

F. Miscellaneous Sources (Sources covered under this Section are as follows: Conveyors, Elevators, Storage Bins, Coal Silo, Fermentation Units, Centrifuges, Evaporators, Rectifier Columns, Thin Stillage Units, Sulfuric Acid Tank, Ammonia Tank, Whole Stillage Tank, Syrup Tank, Slurry Tank, Liquefaction Tank, Yeast Tank, Hammermills, DDGS Dryer, DDGS Cooler, DDGS Truck Loadout, DDGS Rail Loadout, Ethanol Rail Loadout, Ethanol Truck Loadout, Molecular Sieve)

1. Monitoring Requirements

The Permittee is required to perform monthly survey of visible emissions from the chiller system. If the opacity appears to exceed the standard, the Permittee is required to conduct EPA Method 9 observation by a certified EPA Reference Method 9 observer.

2. Recordkeeping Requirements

The Permittee is required to record the emission point being observed, date, time and the results of all observations made, as well as the name of the observer who conducted the test. In the event of opacity going beyond the limit, the Permittee will keep a record of the corrective action taken to bring the opacity below the standard.

G. Flare

1. Monitoring Requirements

a. A survey of visible emissions must be conducted quarterly on the flare when in operation. EPA Reference Method 22 must be used to determine the flares compliance with the zero visible emission limit established in the permit. The observation period must be two hours.

b. The Permittee is required to monitor the presence of a flare pilot flame.

2. Recordkeeping & Reporting Requirements

The Permittee is required to record and report the results of each performance test for VOC emissions.

H. Fugitive Dust

1. Monitoring Requirements

Opacity

The permit requires monthly visual surveys or EPA Reference Method 9 observations of fugitive emissions by a certified Method 9 observer.

2. Recordkeeping Requirements

The Permittee is required to record the emission point being observed, date, time and the results of all observations made, as well as the name of the observer who conducted the test. In the event of opacity going beyond the limit, the Permittee will keep a record of the corrective action taken to bring the opacity below the standard.

VI. TESTING REQUIREMENTS

A. Boilers – NSPS Requirements

- a. The Permittee is required to an annual perform test for ammonia slippage.
- b. The Permittee is required to conduct annual performance tests on the outlets of the stacks for all baghouses for PM₁₀ using EPA Reference Method 5. The Permittee may use the front and back half of EPA Reference Method 5 test to represent PM₁₀.
- c. The Permittee is required to conduct an initial performance test and subsequent tests as required under 40 CFR 60.8 for particulate matter as per reference methods 1, 3, 5, 5B and 17.
- d. The Permittee is required to conduct an initial performance test and subsequent tests as required under 40 CFR 60.8 for sulfur dioxide as per Reference Method 19.
- e. The Permittee is required to conduct an initial performance test and subsequent annual tests for nitrogen oxides as per Reference Method 7E.
- f. The Permittee is required to conduct an annual performance test at the inlet and outlet of the boiler baghouse stack to determine the baghouse efficiency.

B. Internal Combustion Engines – NSPS Requirements

An NSPS subject internal combustion engine with a displacement of less than 30 liters per cylinder that conducts performance tests shall do so according to 40 CFR 60.4212.

C. Synthetic Organic Chemicals Manufacturing

- a. The Permittee is required to conduct an Reference Method 21 performance tests to determine the presence of leaks.
- b. The Permittee is required to conduct an Reference Method 22 performance tests to determine compliance with standards of the flare.

- c. The Permittee is required to conduct a Reference Method 2, 2A, 2C, or 2D, as appropriate to determine the actual exit velocity of a flare.

D. Miscellaneous Sources (Sources covered under this Section are as follows: Conveyors, Elevators, Storage Bins, Coal Silo, Fermentation Units, Centrifuges, Evaporators, Rectifier Columns, Thin Stillage Units, Sulfuric Acid Tank, Ammonia Tank, Whole Stillage Tank, Syrup Tank, Slurry Tank, Liquefaction Tank, Yeast Tank, Hammermills, DDGS Dryer, DDGS Cooler, DDGS Truck Loadout, DDGS Rail Loadout, Ethanol Rail Loadout, Ethanol Truck Loadout, Molecular Sieve)

The Permittee is required to conduct annual performance tests on the outlets of the stacks for all baghouses for PM₁₀ using EPA Reference Method 5. The Permittee may use the front and back half of EPA Reference Method 5 test to represent PM₁₀.

E. Control Flare

- a. The Permittee is required to conduct a VOC destruction efficiency performance test on the control flare within 180 days of issuance of the permit and biennial (once every two years) thereafter. The Permittee is required to monitor and record the net heating value of the gas being combusted in the flare and the exit velocity of gas from the flare stack. The performance test must be conducted in accordance with EPA Reference Method 25A of 40 CFR 60, Appendix A.
- b. The Permittee must conduct volatile organic compounds destruction efficiency test on the flare within 180 days of startup. Subsequent testing shall be done semi annually.

VII. IMPACTS TO AMBIENT AIR QUALITY

A. Introduction

As part of AgriNext Ethanol, LLC. Class II permit application, ADEQ has reviewed the air quality impact analysis (i.e. modeling analysis, AERMOD) submitted by the company. The air quality impact analysis considers operation of four boilers, internal combustion engines, storage tanks, and other miscellaneous equipment.

The purpose of the modeling analysis is to determine whether air quality impacts from proposed criteria pollutant emissions will cause or contribute to a violation of any air quality standard, or worsen an existing air quality problem. Applicable standards include the National Ambient Air Quality Standards (NAAQS).

B. Modeling Analysis Overview

1. NAAQS Analysis

Table 5 below show the results of the NAAQS analysis performed for the Criteria Pollutants to determine if AgriNext Ethanol, LLC. proposed facility would exceed National Ambient Air Quality Standards. All pollutants are within the National Ambient Air Quality Standards.

Table 5: NAAQS Modeling Analysis Results

Pollutant	Averaging Period	Modeled Ambient Concentration^{1,2} (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)
PM ₁₀	Annual	11.4	36	47.4	50*
	24-Hour	30.7	113	143.7	150
	Annual	10.4	7.86	18.3	80
SO ₂	24-Hour	62.1	27.1	89.2	365
	3-Hour	34.4	47.2	81.6	1,300
NO ₂ ³	Annual	2.5	22.6	25.1	100
CO	8-Hour	318.2	1,260	1,578.2	10,000
	1-Hour	562	2,807	3,369	40,000

[1] Concentration shown is worst case scenario.

[2] Results shown are the “high-first-high” for the annual averaging period, “high-second-high” for the one-hour, 3-hour, and 8-hour averaging periods, and the “high-sixth-high” over 5 consecutive years for the 24-hour averaging period. Reported impacts are where the facility’s modeled concentration is above the modeling significance levels. Total impacts where the facility’s concentration is below the modeling significance levels have been disregarded.

[3] Assumes 100% conversion from NO_x to NO₂ for comparison to the NO₂ standard.

VIII. LEARNING SITES POLICY

In accordance with ADEQ’s Environmental Permits and Approvals Near Learning Sites Policy, the Department conducted an evaluation to determine if any nearby learning sites would be adversely impacted by the AgriNext Ethanol facility. Learning sites consist of all existing public schools, charter schools and private schools at the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ.

The Department could not identify any learning sites within two miles of the facility. The Department has determined that the operation of the facility will not adversely affect the learning sites.

IX. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
AQD	Air Quality Division
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
FERC	Federal Energy Regulatory Commission
HAP	Hazardous Air Pollutant
hp	Horsepower
hr	Hour
IC	Internal Combustion
lb	Pound
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standard
NO _x	Nitrogen Oxide
PM	Particulate Matter
PM ₁₀	Particulate Matter Nominally less than 10 Micrometers
PTE	Potential-to-Emit
s	Seconds
SO ₂	Sulfur Dioxide
TPY	Tons per Year
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
yr	Year